FINAL ENVIRONMENTAL ASSESSMENT FOR THE SOIL RECYLING FACILITY AT REDSTONE ARSENAL, ALABAMA

ENVIRONMENTAL MANAGEMENT DIVISION
DIRECTORATE OF PUBLIC WORKS
U.S. ARMY GARRISON – REDSTONE ARSENAL

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INTRODUCTION

The National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508), Department of Defense (DoD) Directive 4715.9, *Environmental Planning and Analysis* (U.S. Department of Defense 1996), and 32 CFR Part 651, Army Regulation (AR) 200-2, *Environmental Analysis of Army Actions* (Department of the Army 2002), which implements these laws and regulations, direct DoD and Army officials to consider environmental consequences when authorizing or approving Federal actions. This Environmental Assessment (EA) analyzes potential environmental impacts associated with the proposed action to construct and operate a petroleum, oil and lubricants (POL)-containing soil Soil Recycling Facility (SRF) at Redstone Arsenal, Alabama.

PROPOSED ACTION

Purpose and Need

There are currently approximately 1,500 cubic yards (cy) of POL-containing soil managed in stockpiles at site locations on Redstone Arsenal which are in heavy use, high visibility areas. The U.S. Army Garrison - Redstone needs a facility away from heavily used areas where POL-containing soils could be managed in a more secure manner.

The U.S. Army Garrison - Redstone also will be conducting investigations and cleanup of the current fuel tankfarm, and decommissioning and demolishing some aboveground bulk fuel tanks at the tankfarm. Additionally, the U.S. Army Garrison - Redstone needs to respond to future POL spills which will inevitably occur and require management of POL-containing soils. These investigations, cleanups, decommissionings, demolitions and spill responses will require additional POL-containing soil remediation activities.

Description of the Proposed Action

The U.S. Army Garrison – Redstone (Figure 1) proposes to recycle POL-containing soils on the installation by transporting excavated soils to a centralized SRF (Figure 2) where active management measures would be used to reduce the POL content in soil to less than 100 parts per million (ppm) of Total Petroleum Hydrocarbons (TPH). Soils with TPH concentrations below 100 ppm are permitted in the U.S. Army Garrison – Redstone construction and demolition (C&D) landfill. The active management measures would include mixing fertilizer and a commercial microbial agent into the POL-containing soils and providing adequate soil moisture control to promote microbial degradation. After the appropriate TPH level is obtained, recycled soils would be used for landfill cover material.

Alternatives Considered

Two alternatives have been considered for the proposed project - the preferred alternative and a no action alternative. Other appropriate treatment and remediation alternatives for POL-containing soils would be considered when these two alternatives are not appropriate or feasible. Separate NEPA analysis beyond this EA would be necessary in the event other alternatives are considered.

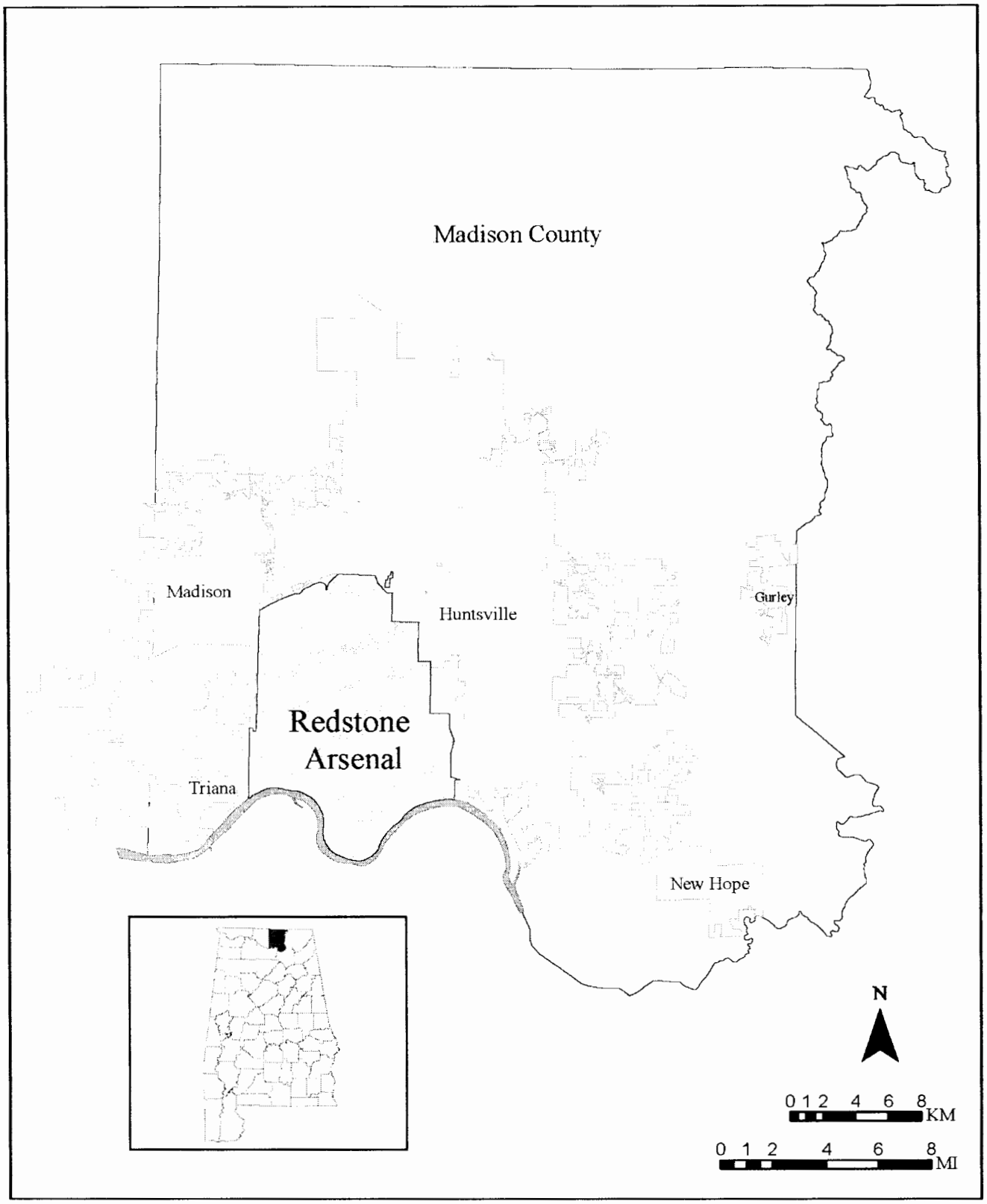

Figure 1 General Location Map of Redstone Arsenal

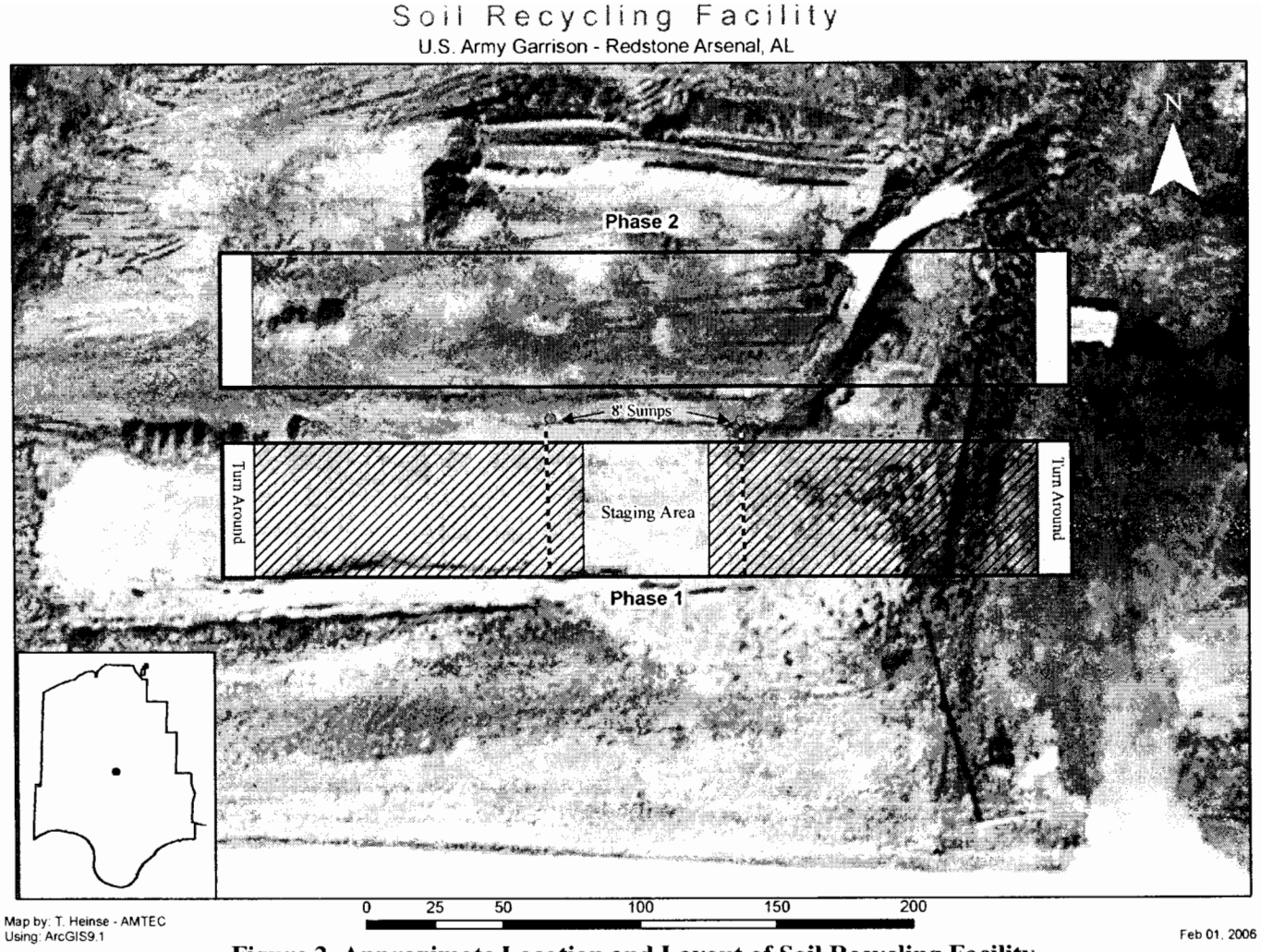

Figure 2 Approximate Location and Layout of Soil Recycling Facility

Preferred Alternative

The SRF would be constructed in two phases. In Phase I, components of a canopy above the former sludge drying beds at inactive Sewage Treatment Plant (STP) #3 south of Martin Road and east of Indian Creek would be disassembled and moved to former Borrow Area #16 (BA 16), north of the C&D landfill. Components of the 120-foot by 60-foot canopy to be moved include steel girders, metal decking, structural steel, rod cross bracings, water supply header, and a sump pump. Concrete footers, girder piers, a sump, and bollards would be left in place at STP #3. Disassembly would not disturb the subsurface since only the aboveground portions of the canopy will be removed. Disassembly of the canopy would not begin until site preparation activities at BA 16 have been completed.

Phase I construction also would consist of construction of two concrete pads at an approximate elevation of 601 feet above mean sea level (msl). The two pads would be end-to-end west to east, beginning at the west central boundary of BA 16. Together the two pads would create a 304-foot by 50-foot concrete pad. The first pad would measure 172-feet by 50-feet and would be made up of three features – a 12-foot long skid-steer turnaround ramp on the west end, a 120-foot long central treatment area with a 1 percent slope down to the east, and a 40-foot long staging area on the east end. The second pad would share the staging area, and would include another treatment area in the center, another turnaround ramp on the east end, and

a new canopy. Three-foot tall, poured concrete retaining walls would be constructed on the north and south perimeters of the treatment pads.

Power and lighting would be installed, along with a water line to provide potable water for a soil wetting sprinkler system. Interceptor trenches with filter packs, located 12 feet from the eastern edges of the treatment areas, would connect to an 8-foot diameter covered sump on the north side of each treatment pad. The 50-foot by 1-foot by 12-inch trenches would contain 6-inch diameter, perforated PVC drainage pipes surrounded by a gravel/sand mix filter pack. The sumps would retain filtered, nutrient-enriched, runoff water for recirculation to the soil piles via the overhead sprinkler system. Wood decking material 50-feet by 1-foot by 1-inch would be placed over the trenches when the facility is idle to minimize stormwater entry into the trenches and sumps.

The site also would be prepared for Phase II construction of another 304-foot by 50-foot concrete pad to the north of the Phase I construction, ultimately providing four treatment cells. Canopies also would be new for this construction. Approximately twenty feet of space left between the Phase I and Phase II sites would allow for an access road and an equipment storage building to be built at a later date.

Following treatment, SRF-recycled soil no longer classified as POL-containing soil would be stockpiled to the north of the processing pads and access road. The length of the new access road would be a minimum of 330 feet. The total project footprint, including the asphalt access road and the stockpile area for recycled soil, would be approximately 1.5 acres.

The Installation Support Services (ISS) Contractor would operate the SRF. Dump trucks would unload POL-containing soils excavated at Redstone Arsenal onto the staging area. A skid loader would move these soils into 120-feet long by 7-feet wide by 3-feet high windrows on the sloped, processing portion of the pads. Each processing pad would accommodate up to five windrows, which would provide a maximum soil process capacity of approximately 470 cubic yards per processing pad. Fertilizer would be mixed with the soil to stimulate the growth of indigenous hydrocarbon-degrading microbes. The windrows would be periodically wetted via the sprinklers to provide the proper moisture content for microbial degradation of volatile and semi-volatile organic compounds (VOCs and SVOCs). Oily water mixtures that drain from the process into the interceptor trenches, then the sand/gravel filter packs, and then into the sumps, would be circulated and sprayed back onto the POL-containing soil pile. The soil would be tested at the ISS contractor laboratory to determine the TPH concentration. Once the TPH level is less than 100 ppm, recycled soil would then be reused as a C&D landfill cover material.

No Action Alternative

POL-containing soils would continue to be managed by onsite treatment or manifesting them off the installation to solid waste disposal facilities permitted by the Alabama Department of Environmental Management (ADEM). Currently, the U.S. Army Garrison - Redstone sends POL-containing soils to the Huntsville Solid Waste Disposal Authority (HSWDA) municipal solid waste (MSW) landfill or stockpiles them onsite until natural degradation occurs. The no action alternative does not meet the purpose and need for undertaking the proposed action, but serves as a baseline for comparison of environmental effects of the action alternatives and cannot be eliminated from analysis under the CEQ NEPA regulations (40 CFR 1502.14(d)).

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Effects to the following environmental resources, and installation facilities and programs were evaluated for the proposed action alternatives: air quality, health and safety, biological resources, cultural resources, waste and materials management, geology and soils, transportation, utility systems, land use, noise, socioeconomics, environmental justice and water resources. Cumulative effects on these resources, facilities and programs were also evaluated. No effects to land use, noise, socioeconomics, and

environmental justice would occur from implementing the proposed action so these topics will not be discussed.

Air Quality

Under the Clean Air Act (CAA), National Ambient Air Quality Standards (NAAQS) have been set for criteria pollutants, which include carbon monoxide (CO), nitrogen oxides (NOx), ozone, sulfur dioxide (SO_2), lead, particulate matter smaller than 2.5 and 10 microns in diameter ($PM_{2.5}$ and PM_{10}). Criteria pollutants are those upon which EPA has placed the greatest emphasis and has developed health-based concentrations for ambient air.

Madison County is included in the Tennessee River Valley – Cumberland Mountains Air Quality Region and is classified as an attainment area for CO, NOx, PM_{10}, $PM_{2.5}$, SO_2 and ozone. EPA designates the attainment classification of a region based on pollutant concentrations in the ambient air as compared to the NAAQS primary and secondary standards (CH_2M Hill). The City of Huntsville Division of Natural Resources, which has an established NAAQS monitoring network, discontinued routine monitoring for lead in 1999 due to the low concentrations measured (0.18 micrograms per cubic meter ($\mu g/m^3$)) relative to the NAAQS (1.5 $\mu g/m^3$)(City of Huntsville).

ADEM issued a major source operating permit under CAA Title V to the U.S. Army Garrison - Redstone in July 2003 that regulates natural gas and fuel-fired boilers, gas-fired generators used for a peak shaving generator system, woodworking and carpentry shops, fuel storage tanks, surface coating operations, remediation systems and fugitive emissions. There are only two emission source categories at Redstone Arsenal that have emission limitations for PM – woodworking and surface coating. Criteria pollutant emissions exceed 100 tons per year (tpy) at RSA. Hazardous Air Pollutant (HAP) emissions at Redstone Arsenal exceed 25 tpy. Therefore, Redstone Arsenal is considered a major source under the Title V program. (CH_2M Hill)

ADEM also requires that air permits be obtained at least 10 days before constructing any building or erecting any equipment which may cause an increase in air emissions per Administrative Code 335-3-14-.01. There is no threshold or minimum size requirement below which this requirement would not apply.

Construction Emissions

Under the preferred alternative, there would be potential short-term minor adverse air quality effects associated with construction activities, which would generate fugitive dust. Dust emissions from SRF construction would vary depending on the number and sizes of vehicles crossing the site, and the silt and moisture content of surface materials. These localized construction-related air quality effects would be reduced by wetting the surface of unvegetated portions of the construction footprint (U.S. EPA). This mitigation practice is consistent with the General Permit Provisos of the Title V permit and the ADEM air regulations at 335-3-4-.02 (ADEM, 2003). Additionally, rainfall in the Tennessee Valley provides natural mitigation of fugitive dusts; 74 days per year at least 0.01 inch of precipitation occurs (USDA, 2002) effectively mitigating fugitive dust.

Volatile Organic Compound (VOC) emissions also would occur during asphalt paving of the access road. These emissions are generated as a result of thinning of asphalt cements with heavy residual oil, kerosene-type solvents (naphtha) and gasoline solvents for use in tack and seal operations, priming road beds for hot mix application and paving operations. VOC emissions would continue for up to three or four months after paving (U.S. EPA, 1995). The heavy vehicles and equipment used during construction and operation of the SRF would also generate emissions from the incomplete combustion of fuels and temporarily degrade air quality in the immediate work zone.

SRF Operating Emissions

In Phase I, the SRF would be used to recycle up to approximately 470 cubic yards (cy) of POL-containing soil at one time. The treatment capacity would increase to approximately 940 cy after the completion of Phase II. Soil recycling would produce fugitive emissions of VOCs. The volume of VOCs emitted would be directly proportional to the volume of soil recycled and the concentrations of VOCs in the soil. During the summer months higher temperatures would increase the rate of volatilization of POLs in recycled soils and increase the rate of biological activity of the soil/fertilizer mixture (ATSDR, 1999). The digestion of POLs by the soil microorganisms would produce carbon dioxide, water and microbial biomass with CO_2 off-gassing. Fugitive emissions from SRF operations are not subject to any additional specific requirements other than those listed in the General Permit Provisos of the Title V permit (ADEM, 2003). No modification of the Title V permit is needed for the SRF operation.

The SRF construction and operational emissions would be localized to the site and would be minor in comparison to the overall Redstone Arsenal fugitive VOC emissions generated from prescribed burning activities, which produced approximately 78 tons of VOC emissions in 2003 (CH_2M Hill).

The SRF construction and operational emissions would not approach the "significant" criteria pollutant emission rates at 40 CFR 52.21; therefore, a Prevention of Significant Deterioration (PSD) analysis is not needed for the proposed action. During the SRF construction, minor adverse effects to air quality from paving operations would be short-term and localized at the preferred alternative site. Minor adverse air quality effects from equipment and vehicle emissions resulting from implementing the preferred alternative would be long-term, but also localized at the SRF site. The air emissions would not result in any significant impacts. Under the no action alternative, there would be no change to the levels of VOC and fugitive emissions at RSA, and no effects to air quality.

Health and Safety

Army Materiel Command Regulation (AMCR) 385-100, *Safety Manual*, establishes the basis for worker safety programs at Redstone Arsenal. AMCR 385-100 requires the Safety Office to review all plans and specifications for new construction and modification to existing facilities for compliance with OSHA construction industry standards in 29 CFR 1926.

Construction projects, such as the SRF, typically involve disproportionate health and safety risks to workers. The construction industry employs 5 percent of the nation's work force, but experiences 20 percent of all occupational fatalities and 12 percent of the total number of disabling injuries (USACE Albuquerque District, Nov. 2002 'Zero Accidents, Zero Tolerance"). Approximately one out of ten construction workers is accidentally injured every year (National Safety Council, 1999).

No equipment with ionizing radiation, lasers or electromagnetic sources, such as microwaves, infrared, ultraviolet or x-rays would be used. The use of heavy equipment for the disassembly of the STP #3 canopy, and construction and operation of the SRF would generate occupational noise. The effects of worker noise exposures would be minimized or eliminated by the use of appropriate hearing protection equipment and/or engineering controls in accordance with the 29 CFR 1926 requirements. Adverse effects to worker health and safety would not occur if proper safety procedures are followed and no accidents occur. No significant impacts to worker health and safety are expected.

The U.S. Army Garrison - Redstone Fire Department operates from three stations: 1) Building 3320 located at Vincent and Redeye Roads; 2) Building 4424 located at Rideout Road and Titan Street; and 3) Building 7801 located at Redstone and Patton Roads. Medical services are available at the Fox Army Health Center at Redstone Arsenal, and off-post at Huntsville Hospital and Crestwood Medical Center. Response times from these Fire Department stations would be adequate. The Fire Department also has

mutual aid agreements with local communities for fire protection and hazardous material incident response.

Methane gas levels are monitored annually at the C&D landfill, formerly a solid waste facility, located south of BA 16/SRF, in accordance with the Solid Waste Landfill Operating Permit and the Methane Monitoring Plan (Appendix B of the Operation Plan, ADEM, 2001). MSW activity ceased in 1991. Gas monitoring results indicate there is no or little methane gas production occurring; however, "Danger Methane Present" signs are posted in the project area. Based on monitoring results, U.S. Army Garrison - Redstone has requested that ADEM limit the methane gas monitoring requirement in the operating permit to annual screening of landfill administration and equipment storage buildings for explosive gas. Methane gas monitoring would not be necessary for the excavation of the concrete pad under the preferred alternative (K. Hewitt, PWE).

The no action alternative would not require any construction or operating activities and would not result in any adverse affects to health and safety.

Biological Resources

The Redstone Arsenal Integrated Natural Resource Management Plan (INRMP) provides forest, fish and wildlife, and land management practices and maintenance procedures as required by AR 200-3 (U.S. Army Aviation and Missile Command or AMCOM, 2002). The following sections present pertinent summary data from the Endangered Species Management Plan (ESMP, Appendix Z in the INRMP) and the Redstone Arsenal Natural Heritage Inventory (TNC) for use in evaluating biological resources.

Federally Threatened and Endangered Species.

Endangered species, as defined by Section 3 of the Endangered Species Act (ESA), are those that are at risk of extinction throughout all or a significant amount of their range. Threatened species are those at risk of becoming endangered in the near future throughout all or a significant portion of their range.

Federally threatened and endangered (T & E) species known to occur at Redstone Arsenal are the gray bat, bald eagle, American alligator, Price's potato bean and the Alabama cave shrimp. The gray bat (*Myotis grisescens* E.) roosts in Tennessee Valley caves and is known to forage along waterways, but no resident colonies are currently known to exist on the installation. The bald eagle (*Haliaeetus leucocephalus* E.) is found near open waters and is known to forage and occasionally roost on the installation, but no permanent nests are known. Price's potato bean (*Apios priceana* T.) is found in open wooded areas along forest edges on bluffs with calcareous soils. The Alabama cave shrimp (*Palaemonias alabamae* E. is found in one Redstone Arsenal cave. The American alligator (*Alligator mississippiensis* T.) was introduced to Redstone Arsenal and resides in wetland and riparian areas. The Indiana bat (*Myotis sodalis* E.) potentially occurs on Redstone Arsenal due to available foraging habitat, but no roosting areas have been identified and no individuals have been observed. No critical habitat has been designated under the ESA at Redstone Arsenal (AMCOM, 2002).

BA 16 is not in close proximity to any of the areas used by these species at Redstone Arsenal. The disassembly of the canopy would be conducted in daylight hours and would not affect Indiana or gray bat foraging areas. The disassembly of the canopy, the construction and operation of the SRF, and the no action alternative would have no affect on the T & E species at Redstone Arsenal.

Federal Species of Concern and State Protected Species

No Federal Species of Concern or State protected species occur near BA 16. The preferred and no action alternatives would not have any affect on Federal Species of Concern or on state protected species at Redstone Arsenal.

Wetlands and Ecologically Sensitive Areas

Wetlands are not present at STP #3 or at BA 16. BA 16 is not in the vicinity of any of the designated ESAs at Redstone Arsenal. STP #3 is not near any of the ESAs but is adjacent to wetlands along Indian Creek (The Nature Conservancy, 1995). Canopy disassembly at STP #3 would not disturb the ground surface, so there would be no effects to the adjacent wetlands. The preferred and no action alternatives would not have any affect on wetlands or ESAs.

Cultural Resources

The DoD Legacy Program defines cultural resources to include four types of resources: 1) historic sites and districts, including archaeological sites, 2) historic personal and related property; 3) historic records; and 4) community resources and life ways. Cultural resources also include prehistoric and historic sites, structures, districts, artifacts, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional religions or any other reason (Canter et al, 2005).

Archaeological Resources

Archaeological resources include any material remains of past human life or activities, which are of archaeological interest. This includes pottery, baskets, weapons, projectiles, tools, structures or portions of structures, pit houses, rock paintings, rock carvings, skeletal remains, and graves (ARPA, 1979 and Canter et al, 2005).

STP #3 was constructed in the 1940s on a portion of an archaeological site. STP #3 is encompassed within an area that has undergone a Phase I archaeological survey (The Draft 2000-2003 Phase I Archaeological Survey of 2,834 Hectares (7002 Acres) on Redstone Arsenal, Madison County, Alabama Volumes I and II, November 2004). This report has not yet been sent to the Alabama State Historic Preservation Office (ALSHPO) for review. The site is recommended as potentially eligible in this survey report. Based on work conducted by Alexander Archaeological Consultants (AAC) at Redstone Arsenal over the past 9 years, it is reasonable to expect that the ALSHPO will concur with the findings of the report (Hoksbergen, CNR).

During Phase I of the proposed action, further disturbance to this site would be avoided by leaving the concrete footings and girder piers of the canopy in place. Disassembly of the canopy would have no affect on this site. No additional mitigation for archaeological resources would be necessary for the disassembly of the canopy. BA 16, which is immediately north of the C&D landfill, has been previously disturbed and no evidence of cultural material remains. This area is cleared from an archaeological perspective (Hoksbergen, CNR). There would be no affect to cultural resources from the no action alternative.

There are no significant impacts expected to cultural resources from the Proposed Action. If, during construction activities, the selected contractor observes items that might have historical or archaeological value, such observations shall be reported immediately to the Installation's Cultural Resource Manager so that the appropriate authorities may be notified and a determination can be made as to their significance and what, if any, special disposition of the finds should be made. The construction contractor shall cease all activities that may result in the destruction of these resources and shall prevent employees from

trespassing on, removing, or otherwise damaging such resources. Should human remains be encountered during the construction or clearing, Federal and Alabama cultural resource preservation statutes specify that work shall cease immediately and the proper authorities be notified.

Waste and Materials Management

Redstone Arsenal was placed on the Superfund National Priorities List (NPL) in 1994. Prior to the NPL listing, numerous Solid Waste Management Units (SWMUs) were managed under the Resource Conservation and Recovery Act (RCRA) program since the arsenal operated RCRA storage and treatment facilities. Redstone Arsenal filed a RCRA Part A Hazardous Waste Permit application in 1992 and applied for a RCRA Part B permit in 1995. Redstone Arsenal was issued Part B permit # AL72100020742 in April 1998 by ADEM. This permit expires in April 2008. The Part B permit identifies a total of 235 SWMUs. Currently 89 SWMUs are managed under the CERCLA program and 146 SWMUs are managed under the RCRA program or other non-CERCLA program. Inactive STP #3 was designated as SWMU – 009. (Shaw, 2005).

Hazardous Materials

The presence of munitions and explosives is considered to be an unlikely probability in BA 16. Canopy disassembly at STP #3 and the SRF construction and operation would require the use of fuels to power vehicles and heavy equipment. Under normal uses as fuels, lubricants or paving materials, petroleum products are not considered hazardous materials (ATSDR, 1999). Fuel storage for vehicles and equipment used at the preferred alternative site should not be necessary. In the absence of fuel spills and leaks, there would be no effects from hazardous materials under the preferred alternative. The proposed action would not have any effect on the U.S. Army Garrison - Redstone hazardous material management program.

Hazardous Waste

The C & D landfill, south of BA 16, was operated as a sanitary landfill from 1973 to 1991 and has been designated as RCRA SWMU RSA-10. The U.S. Army Garrison - Redstone Installation Restoration (IR) Branch staff has reviewed the proposed action and determined that the preferred alternative site at BA 16 is not within any designated CERCLA Operable Unit. Disassembly activities at STP #3, which has been designated as SWMU-009, have been coordinated through Installation Compliance Branch (IC). Disassembly would not disturb the subsurface since only the aboveground portion of the canopy will be removed. No access control restrictions are needed at STP #3 per the IC Branch or at BA 16 per the IR Branch (see Appendix B).

The SRF would not produce any hazardous wastes. Prior to placement of any POL-containing soil in the SRF, soil would be analyzed using the RCRA Toxicity Characteristic Leaching Procedure (TCLP) for corrosivity, ignitability, toxicity, or reactivity. Any tested soil that fails the TCLP analysis would not be placed in the SRF, and would be managed and disposed of as hazardous waste.

Disassembly and removal of the STP #3 canopy could allow stormwater to contact residual sludge in the drying beds. Larger storms could potentially wash materials out of the basins. The 2001 Installation Action Plan states that STP #3 received wastewater from oil/water separators (OWSs) used for processing organic and metal impacted liquids and sludges. The U.S. Army Garrison - Redstone plans to implement a RCRA Corrective Measures Implementation (CMI) at SWMU-009, which will include the removal of the residual sludge in the drying beds. The sludge would be disposed of in accordance with ADEM requirements. CMI implementation would prevent any possibility of washout. The preferred and no action alternatives would not have any affect on U.S. Army Garrison - Redstone hazardous waste sites or hazardous waste operations.

Solid Waste

The U.S. Army Garrison - Redstone operates a C&D landfill under ADEM solid waste permit (ADEM No. 45-03), The permit allows disposal of construction rubble; insulation; asbestos, masonry, concrete, rock, roofing, and wood wastes; sand, sheetrock, yard trimmings, soil, leaves, asphalt, scrap metal, ash from wood combustion and similar types of wastes. This landfill receives an average of approximately 222 tons per day. The solid waste permit allows the disposal of an average daily weight of 300 tons per day. The permit expires October 8, 2006.

The U.S. Army Garrison - Redstone currently sends most non-hazardous, POL-containing soils to the Huntsville Solid Waste Disposal Authority (HSWDA) MSW landfill located at 4100 Leeman Ferry Road in Huntsville (ADEM Landfill Permit No. 45-01). The HSWDA MSW landfill is approximately 1 mile northeast of Redstone Arsenal Gate 5.

Small quantities of construction debris, such as recyclable concrete and waste wood block forms, initially would be generated by SRF construction activities. The amount of construction debris generated would have little or no effect on the landfill capacity. At current rates of C&D debris generation, the landfill is expected to operate for 30 more years before reaching its capacity.

SRF operation would have no impact on the installation C&D landfill since POL-containing soils are not disposed of at that location. There would be a reduction in the volume of solid wastes generated as a result of recycling of POL-containing soil under the preferred alternative. Implementation of the preferred alternative would result in a beneficial, but non-significant impact on the U.S. Army Garrison - Redstone solid waste management program.

Geology and Soils

Soils at BA 16 have been classified as urban land – Decatur-Emory complex. Decatur and Emory series soils consist of very deep, well drained, moderately permeable soils (0.6 – 2.0 inches/hour). Decatur soils consist of silty clay and clay. Emory soils consist of silt loam, silty clay loam, gravelly silty clay and very gravelly silty clay loam, and are found along drainage ways and depressions (USDA, 2002).

All construction activities that disturb an acre or more of land, such as the SRF, require a construction stormwater permit to manage sediment from soil erosion prior to groundbreaking per ADEM Administrative Code 335-6-12. ADEM also requires that a Construction Best Management Practices Plan (CBMPP) be prepared by a Qualified Credentialed Professional (QCP) to implement Best Management Practices (BMPs) designed to minimize pollutant discharges in stormwater runoff to the maximum extent practicable during land disturbance activities. Operators/owners must also register construction activities by submitting a Notice of Registration and have regular inspections conducted by a QCP, a trained person under the direct supervision of a QCP or by a Qualified Credentialed Inspector (QCI) trained through the Qualified Credentialed Inspection Program (QCIP).

During SRF construction, Best Management Practices (BMPs) would be implemented and maintained in accordance with the *Alabama Handbook for Erosion Control, Sediment Control and Stormwater Management on Construction Sites and Urban Areas*. Implementation of appropriate erosion control measures as specified in the CBMPP would reduce or eliminate soil erosion from the construction footprint. There would be no effect on plant growth nor any loss of plant nutrients in topsoil since it has already been removed in BA 16. There would be short-term minor adverse affects if soil erosion occurs during the SRF construction. This soil erosion would not be a significant impact.

During operation, the SRF canopy would extend 5 feet beyond the north and south edges of the soil processing pads, effectively blocking most stormwater from falling on the processing pads. Three-foot high retaining walls on the north and south perimeters of the pads would deter surface stormwater flow

into the SRF. Any stormwater that accumulates on the processing pads would flow into an interception trench, then into the sumps, where it would be pumped back onto the processing piles. Excess stormwater/process water mixtures would be pumped into a vacuum truck and taken to the Central Oil Water Separator (OWS) at Building 5427, which has an approximate capacity of 12,000 gallons. After separation of oils and emulsions, wastewaters from the OWS are piped directly to the sanitary sewer system. Erosion and sedimentation would not occur under these practices and, therefore, no effects would occur to the geology and soils.

Implementation of the no action alternative would not result in any affects to geology and soils.

Transportation

The proposed action would have no effect on the Redstone Arsenal Airfield, the Southern Railway Classification Yard located west of Rideout Road near Gate #9, or on the Redstone Arsenal port and terminal facilities on the Tennessee River so these transportation facilities will not be discussed.

Roads

Major roads at Redstone Arsenal include Rideout, Patton, Goss, Martin and Redstone Roads, and the Toftoy Thruway. About 34,000 vehicles enter through arsenal gates each day (INRMP).

BA 16 is accessed by following Mills Road to Refuge Road which then terminates at the landfill access road. Use of these roads would continue. The SRF processing pad could accommodate up to 30 dump truck loads of POL-containing soil at any one time but delivery would be staggered and not concurrent. The immediate area of the preferred alternative site would experience short-term periodic increases in traffic volume during SRF construction and operations activities. There would also be short-term periodic increases in traffic volume at POL-containing soils excavation and stockpile sites. These minor increases in traffic would not require any change to surrounding traffic patterns and mostly would occur during off-peak traffic periods. Overall there would be an insignificant impact on installation roads under the preferred alternative. Under the no action alternative there would be no impacts to installation roads.

Utility Systems

Utility systems include those facilities and systems that provide power, water supplies and wastewater treatment. Redstone Arsenal has extensive steam heating and natural gas distribution systems, and a non-potable industrial water system. These utility systems would not be affected by the proposed action because no steam heat, natural gas or non-potable water would be needed. The SRF would require power and lighting, but would not require any space heating. There would be no impacts to the arsenal electrical system under the proposed action. Prior to any excavation for the SRF concrete pad, a digging permit would be obtained to comply with U.S. Army Garrison - Redstone Facilities Division Procedure # 011-220-400.

Water Supply

The SRF would be supplied by water from Water Treatment Plant No. 3 (WTP 3) (G. Daniels, PWE). The arsenal obtains raw water from the Tennessee River to produce the majority of the potable water supply. Potable water is supplied from two WTPs; WTP No. 1 and No. 3. WTP 3 has a capacity to produce 4.5 million gallons per day (mgd) of potable water from industrial water supplied by WTP 1. WTP 1 has a capacity to produce 22 mgd for industrial uses and 3 mgd for potable uses. In 2003, WTP 3 produced an average of 3.2 mgd. These plants are regulated under ADEM Operating Permit No. 2005-552, which expires in 2010 (ADEM, December 2004).

SRF operations would use potable water to increase the POL-containing soil moisture content when needed. The sprinkler heads to perform this activity would have a capacity of 3 gallons per minute (gpm) or 0.004 mgd if they operated continuously. The sprinklers will be operated intermittently, not continuously. However, even at a continuous usage rate, SRF operations would result in a negligible, insignificant demand on the potable water system. Implementation of the no action alternative would not require any additional potable water use and would have no effect on the U.S. Army Garrison – Redstone water supply system.

Wastewater Systems

The arsenal has separate wastewater systems for managing sanitary wastes, storm and process wastewaters, and stormwater from municipal sources. The municipal stormwater and stormwater and process wastewater systems will not be affected by the proposed action and will not be discussed.

Sanitary Sewer System

During the SRF operation, excess stormwater/process water mixtures from the soil processing pad would be pumped into a vacuum truck and taken to the Central OWS near Building 5418. The Central OWS consists of five storage tanks with an aggregate storage volume of 32,000 gallons. After separation of oil and emulsions, wastewater from the Central OWS is piped directly to the sanitary sewer system. Effluent from the Central OWS flows to the Centralized Wastewater Treatment Plant (CWWTP) located south of Buxton Road, which is owned and operated by PDR Properties, Incorporated under NPDES Permit # AL0062863. This NPDES permit was issued in March 2004 and expires on March 31, 2009.

The CWWTP is an activated sludge plant that provides screening, aeration, clarification and ultraviolet disinfection treatment processes prior to effluent discharge to the Tennessee River. Sewage sludge is thickened, air dried and transported to the City of Huntsville Waste To Energy Plant for incineration. The CWWTP has a hydraulic capacity for 9 mgd and a design capacity of 3.3 mgd. At present, the daily flow rate is only 1.9 mgd (R. Makkouk, PWE).

The additional Central OWS effluent would be easily accommodated by the remaining 1.4 mgd of excess design capacity available at the CWWTP. The SRF operators would utilize existing personal sanitary facilities at the landfill offices across the access road from the SRF. The SRF operation would not generate any sanitary wastewaters. The preferred and no action alternatives would have no affect on the sanitary sewer system.

Water Resources

Effects to the groundwater and surface water resources of Redstone Arsenal are discussed in this section.

Groundwater

None of the aquifers in Madison County has been designated as sole source aquifers per Section 1424(2)g of the SDWA of 1974 (AMCOM, 1994). Groundwater in the shallow residuum discharges to surface water bodies and to deeper portions of the residuum. Groundwater flow in the shallow residuum generally follows the slope of the land surface. The lower residuum also discharges to surface water bodies and the bedrock. Regional groundwater flow in the residuum and bedrock is primarily southwest toward Wheeler National Wildlife Refuge (ICF Kaiser).

In the Tennessee Valley, unconsolidated layers of clay and gravel at the ground surface are called regolith. The shallow portion of the regolith at the preferred alternative site is characterized by very high-amplitude water level fluctuations as indicated by data from bedrock monitoring well RS-081 near the southwest corner of this site. The eastern portion of BA 16 no longer will be used as a source of landfill

cover materials once the lowest point of 589 msl is reached. The potentiometric surface in the bedrock aquifer at this well is typically between 561 and 571 msl (GSA, 1996; Shaw Environmental, 2004). Shallow excavation for the SRF concrete pads construction would not encounter groundwater. No dewatering activity would be needed for the SRF construction.

The concrete-lined interceptor trenches and sumps would prevent releases of POL to the subsurface during the SRF operation. Excess waters would be pumped from the sumps into a vacuum truck and put in the Central OWS at Building 5427. No discharge of SRF process waters to the soil or subsurface would be allowed. The SRF construction and operation would not contribute any contaminants to groundwater in the vicinity and would not affect ground water. The no action alternative would result in no effect to groundwater.

Surface Water

The Tennessee River is the southern boundary of the installation. Major systems that flow through the installation include Indian Creek, Huntsville Spring Branch (HSB), and McDonald Creek, which empty into the Tennessee River. McDonald Creek drains the northeastern portion of the installation and empties into HSB. HSB flows from the city of Huntsville onto the installation and runs in a westerly direction before emptying into the Wheeler Lake Reservoir. Indian Creek flows through the northwestern portion of the installation in a southerly direction before emptying into the Tennessee River at Wheeler Lake Reservoir near the southwestern boundary of the installation.

STP #3 is adjacent to Indian Creek. Implementation of the CMI at SWMU-009 (STP #3) prior to the disassembly of the canopy would eliminate the possibility of residual sludge washout and result in no effect to Indian Creek.

STP #3 and BA 16 are not in the 100-year floodplain. In March 1973, the highest flood level of 575 msl was recorded at the arsenal (INRMP). Final site elevation at the SRF following site preparation activities would be 601 msl.

Stormwater from the borrow area east of the preferred alternative site flows through a culvert under the landfill access road, and continues northward in a drainage swale between this site and gravel stockpile/wood chipper area to the east. The drainage swale bends eastward near the tree line to the north and empties into the drainage ditch along the east side of the landfill. The landfill drainage discharges to wetlands along HSB.

Implementation of appropriate erosion control measures as specified in the CBMPP would minimize or eliminate pollutant discharges in construction-related stormwater runoff from affecting surface waters in the landfill drainage. The impact of stormwater runoff would not be significant. The SRF canopy and retaining walls would prevent most stormwater from contacting POL-containing soils during its operation. The concrete processing pads, interceptor trenches, and sumps would provide containment for any oily water/oily mixtures resulting from wetting, and would prevent drainage from the active portions of the SRF site into downgradient surface water. The no action alternative would not result in any impact to surface water resources.

Natural or Depletable Resource Requirements and Conservation Potential

Depletable resources associated with the disassembly of the STP #3 canopy and the construction and operation of the SRF include the use of fuels to power vehicles and equipment. The asphalt and concrete surfaces placed for the SRF would result in the loss of some soil functions (filtering), but would be more than offset by the operation of the SRF, which would lessen or prevent the loss of soils resulting from off-post disposal of POL-containing soils and allow appropriate reuse of the recycled soil. Use of the above

ground components of the STP #3 canopy from the STP at the new location conserves structural materials, and avoids the need to obtain them for Phase I of the SRF.

Irreversible or Irretrievable Commitment of Resources

Irreversible and irretrievable commitment of resources that would result from the disassembly, reconstruction and operation of the SRF include the expenditure of financial resources and the use of asphalt, concrete, base and sub-base materials for road and structure construction. The potential commitment of an additional part-time ISS contractor employee is not irreversible due to the possibility of using that person on other landfill operation activities when the SRF operations are slowed or closed.

Cumulative Effects

The President's Council on Environmental Quality (CEQ) defines cumulative impacts as the impact on the environment which result from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions (RFFAs). Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time (40 CFR 1508.7).

RFFAs planned at Redstone Arsenal include Base Realignment and Closure (BRAC) actions announced on May 13, 2005 by the Secretary of Defense. BRAC recommendations included relocating the Missile Defense Agency, Space and Missile Defense Command, Army Materiel Command, and the Army Security Assistance Command Headquarters to RSA. The accommodation of these headquarters would require the construction of up to 1.7 million square feet of administrative space at RSA. The locations to be considered for this additional space include three locations along Martin Road.

The BRAC-related construction activities would produce localized minor adverse effects to air quality from engine, equipment, paving and fugitive dust emissions. Final BRAC decision was announced on November 9, 2005. BRAC-related construction activities would not begin before 2007. The SRF construction and operation would have no incremental effect on these BRAC projects or on air quality due to its likely completion prior to the start of these projects.

The C&D landfill, south of the SRF site, was operated as a sanitary landfill from 1973 to 1991 and was designated as RCRA SWMU RSA-10. The drainage ditch to the east of RSA-10 was sampled as part of the investigation of that site. The chemicals of potential concern identified in ditch sediment samples include DDT (dichlorodiphenyltrichloroethane), di-n-butylphthalate, butylbenzylphthalate, calcium, magnesium and sodium. (ICF Kaiser, August 1999). The DDT concentration is attributable to the DDT Disposal Area located east of the ditch.

A portion of HSB has been listed on the State of Alabama Clean Water Act Section 303(d) "impaired" waters list. HSB was placed on this list due to the presence of sediments contaminated with priority pollutant organic compounds. The 10.4-mile segment of HSB designated as impaired begins upstream of the installation at Johnson Road and ends at its confluence with Indian Creek on Redstone Arsenal. This segment includes portions of HSB downstream from RSA-10.

Appropriate erosion control measures as specified in the CBMPP for the SRF construction would be used to minimize or eliminate pollutant discharges in surface runoff. These erosion control measures would ensure that the preferred alternative would have no incremental effect on the water quality and contaminated sediments of the drainage ditch, the HSB wetlands, or the impaired waters of HSB. The no action alternative would have no incremental effect on the above BRAC actions or on air and water quality.

A planned water supply change will occur in late 2006 or early 21007. Water will be supplied by the City of Huntsville through Huntsville Utilities rather than from US Army Garrison – Redstone onsite sources

and treatment. The small quantity of water to be used at the SRF would have no effect on the utility's capacity to provide water or on the US Army Garrison – Redstone water distribution system.

CONCLUSIONS

This section summarizes the environmental effects of undertaking the proposed action, and identifies required permits and plans for implementing the preferred alternative, and the required mitigations to support a Finding of No Significant Impact (FNSI).

Summary of Environmental Effects

Localized minor adverse effects to air quality would be expected to result from implementing the preferred alternative. The minor adverse effects from paving and engine emissions cannot be avoided. Fugitive dusts from construction activities would be reduced or eliminated by wetting the ground surface. Potential minor adverse effects to soils and surface water resources may also result from implementing the preferred alternative. These effects would be mitigated by implementing appropriate erosion and sediment control measures as required in a CBMPP. Implementation of the CMI at SWMU-009 would eliminate the possibility of residual sludge washout after canopy disassembly from STP #3 and result in no adverse impact to the hazardous waste program or Indian Creek. Prohibiting ground disturbance during the disassembly of the STP #3 canopy would avoid adverse effects to an archaeological site at STP #3. Implementing the preferred alternative would be expected to result in beneficial effects on the U.S. Army Garrison solid waste programs. The following table summarizes the anticipated environmental effects from implementing the preferred alternative and the no action alternative.

Table 1 – Summary of Environmental Impacts

Redstone Arsenal Environmental Resources,Facilities and Programs	**Proposed Action** (Construction/Operation)	**No-Action Alternative**
Air Quality	Insignificant minor adverse impact*	No impact
Health and Safety	No impact **	No impact
Biological Resources (*Flora and Fauna, Threatened and Endangered Species, Federal Species of Concern, State Protected Species, Wetlands and Environmentally Sensitive Areas)*	No impact	No impact
Cultural Resources (*Archaeological Resources*	No impact ***	No impact
Waste and Materials Management	No impact	No impact
Hazardous Materials	No impact	No impact
Hazardous Waste	No impact ****	No impact
Solid Waste	No impact/beneficial (not significant) impact	Adverse (not significant) impact
Geology and Soils	Potential minor adverse insignificant impact/no impact	No impact
Transportation (*Roads)*	No impact	No impact
Utility Systems (*Electrical System; Steam Heat and Natural Gas Distribution Systems; Potable and Industrial Water Systems; Sanitary Sewer, Municipal Stormwater, Stormwater and Process Wastewater Systems)*	No impact	No impact
Land Use, Noise, Socioeconomics, Environmental Justice	No impact	No impact
Water Resources	See Surface Water	No impact
Surface Water	SRF site - Potential minor adverse	No impact

	insignificant impact; STP #3 - No impact	
Groundwater	No impact	No impact
Cumulative Effects	No incremental impact	No incremental impact

Notes: *Construction air quality effects would be short-term. **Magnitude of effects for any construction related accident cannot be predicted. ***As long as subsurface disturbance of STP #3 is avoided during the disassembly of the STP #3 canopy. ****As long as residual sludge in drying beds at STP #3 is removed prior to disassembly of the STP #3 canopy.

The preferred alternative meets the purpose and need for the proposed action. The no action alternative does not meet the purpose and need, but provides an environmental baseline for comparing the environmental effects of the action alternative. The proposed action would not result in any significant impacts to the environment, therefore the preparation of an Environmental Impact Statement is not necessary. A Finding of No Significant Impact (FNSI) is appropiate for this proposed action.

Required Permits, Plans and Mitigations to Support a FNSI

Prior to implementing the preferred alternative, the following permits must be obtained:

- Construction air permit per ADEM Administrative Code 335-3-14-.01;
- General NPDES Construction Stormwater Permit per ADEM Administrative Code 335-6-12;
- Digging permit per U.S. Army Garrison – Redstone Facilities Division Procedure #011-220-400

A Construction Best Management Practices Plan (CBMPP) must also be prepared prior to undertaking the preferred alternative.

The following mitigations must be conducted to support a FNSI for this proposed action:

- Implementing erosion control measures specified in the CBMPP that are designed to minimize pollutant discharges in stormwater runoff during land disturbing activities;
- Removal of residual sludge from the drying beds at STP #3 as part of the CMI at SWMU-009
- Avoidance of subsurface disturbance during the disassembly of the canopy at STP #3

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APPENDIX B
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U.S. Fish and Wildlife Service, Ecological Services Division, Daphne, Alabama.
Alabama Historical Commission
AMCOM Legal Office, Redstone Arsenal, Alabama.
Marshall Space Flight Center, NASA.
Tennessee Valley Authority
Alabama Department of Environmental Management, Montgomery, Alabama.

APPENDIX C
Environmental Site Work Plan Evaluation Checklist

Environmental Site Work Plan Evaluation Checklist
(Non-RI/FS/ROD)

Site / Activity Information		
Environmental Site Number:	DPW Tracking: 2005146-14	EMD Tracking: 1128-05
Title Dismantle, Move, and Construct Soil Recycling Facility Cell 1 :		
Requestor: TERRY HAZLE	Point of Contact: Ken Hewitt	
Office Symbol:	Bldg. # or Area	
Phone:	Email:	

A Project Work Plan is required to be submitted through PWE/Public Works Environmental for an environmental evaluation. The PWE may require other submittals before any job commences.
Required Submittals if **CERCLA** Site is Affected:
☐ - Key Personnel List - Project Manager, Safety Officer, etc ☐ - Project Safety and Health Pla
☑ - Project Work Plan (attached ☐ - Other, Specify
☐ COPIES OF REQUIRED SUBMITTALS SHALL BE FORWARDED TO IMSE-RED-PWE BEFORE JOB COMMENCES

Reviewer Certification / Recommendation

1. Based on my review of the data provided about the nature of the work to be preformed this activity i
   ☑ - Approved, Project is not on an identified CERCLA Site or contingencies are not required.
   ☐ - Approved, contingent on the controls noted being implemented.
   ☐ - Disapproved.
2. Regulatory oversight concurrenc ☐ - is / ☐ - Is not - recommended by ☐ - ADEM, ☐ - EPA.

Primary Reviewer Signature: Troy W. Pitts, Garrison/Installation Restoration Program, 642-2836	Date: 22-Aug-05
Final Reviewer Signature: Carl W. Smith, Garrison/Installation Restoration Program, 876-9479	Date: 23-Aug-05

Regulatory Agency Review

ADEM Approved By:	**EPA** Approved By:
☐ - Concur Date:	☐ Concur Date:
☐ - Do Not Concur	☐ - Do Not Concur
☐ - Conditional Concurrence (Specify:)	☐ - Conditional Concurrence (Specify:

Special Instructions / Restrictions / Notes

This project is not within any existing CERCLA site access control boundary.